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THE CATHEDRAL OF AUXERRE, IN FRANCE.

## THE CATHEDRAL OF AUXERRE.

AUXERRE is a city of France, situated at a distance of rather more than a hundred miles to the south-east of Paris. It is now the capital of the Department of the Yonne;—formerly it was the chief town of the district known by the name of the Auxerrois, or County of Auxerre, which was included in the province or duchy of Burgundy. The place is of considerable antiquity: it is repeatedly spoken of during the latter ages of the Roman Empire, under a great many different names. Autissiodurum, Autissiodorum, and Autosiodorum, are three varieties; and if any one of our readers should wish for more, he will find eleven others enumerated by Morel in his *Grand Dictionnaire*. This many-named town was originally in the territory of the people called *Senones*, who occupied the country of which Sens is now the capital; but under one of the Roman emperors, it was erected into a city, with a *pagus*, or district, of its own.

After the fall of the empire, Auxerre passed into the hands of the Franks; and under the early kings of France, it belonged, together with the county, to the bishops of Auxerre. They bestowed it, subject to certain conditions, on the counts of Nevers or Nivernois, who sold it, with the county, to the crown of France in the latter half of the fourteenth century, for 30,000 golden francs. About sixty years afterwards, it was again alienated from the royal dominions, being given up by Charles the Seventh, to the Duke of Burgundy, for the purpose of detaching him from the alliance which he had formed with the English, during the reign of our Henry the Sixth; but Charles's crafty son, the politic Louis the Eleventh, quickly recovered possession of it, when the death of his hot-headed and formidable rival, the bold Duke of Burgundy, left him at liberty to pursue his favourite project of reducing the power of his vassals. From this time forward it remained annexed to the territory of the crown; the bishops, its original owners, retaining some slight marks of their former sovereignty. Of course these relics of feudality, like all others, were abolished at the revolution. While under the dominion of these various masters, Auxerre underwent the usual vicissitudes of an ancient European city. It suffered considerably in the fifth century, when Attila, with his Huns, penetrated into the heart of Gaul: "the Scourge of God," as the barbarian called himself, captured the city, and nearly reduced it to ruins. The Normans scarcely treated it better; and in 732, the Saracens pillaged it completely. In subsequent times, it bore its full share of the misery which the frequent domestic disputes of France brought upon the whole kingdom; during the sixteenth century in particular, it felt deeply the injurious consequences of the religious wars which then raged.

The modern city of Auxerre is described as "a fine old town, but dirty, and with narrow crooked streets." It is built on the side of a hill, upon the left or western bank of the river Yonne, which gives its name to the department; its situation is remarkably fine, and the air pure. Perhaps the town itself is hardly worthy of the spot on which it stands. "The surrounding country," says a French writer, "is delicious; but the interior of the city is disagreeable. It possesses only two public squares,—both very small, and but one street which is worthy of mention. Its churches constitute the whole of its attraction; and the episcopal palace is its only remarkable monument;—it is the finest episcopal edifice in France."

The origin of the bishopric of Auxerre is referred to a very ancient date,—so early indeed as the third century. The first prelate who occupied the see, was

S. Peregrinus, or as the French call him, S. Pélérin, which we may render "St. Pilgrim." He was sent from Rome by Pope Sixtus the Second, at the request of a few Christians of Auxerre, who, seeing that the people around them were deeply sunk in the darkness of paganism, were desirous to obtain the presence of some one who might effect their conversion. The eloquence of the missionary, and the goodness of his cause, procured him success; at his persuasion, the pagans on the borders of the Yonne renounced their cherished idols, and embraced the Christian faith. The bishop then built a small church on the banks of the river; but soon afterwards, while upon a mission to a neighbouring district, he was seized, and put to death. About a century afterwards, the original church was found too small for the constantly increasing number of the Christians; and St. Amatre, the fifth bishop of the see, established one more commodious within the walls of Auxerre. This was the first Christian temple that is known to have been built in that town.

At different times subsequent to the period of its erection, the edifice underwent various alterations and restorations, being enlarged, and enriched with presents of considerable value, by the respective prelates who held the see; but in the ninth century it was burnt down. It was quickly rebuilt, however, and in 932 again reconstructed, for the first time in the form of a cross, by the then bishop, who bestowed a number of rich gifts on his new cathedral, and was the first to be buried within its walls. But the edifice which his piety had raised was doomed to a very short existence, for in the year 1030, before a hundred years had elapsed since its erection, it was demolished by fire. Fortunately, the prelate who then occupied the see of Auxerre, was equally zealous with his predecessor of the former century; and the church was soon rebuilt: it was constructed of freestone; and on this occasion were built the fine crypts which remain to the present day.

The duration of this edifice was not more extended than that of its predecessors, notwithstanding its superior solidity; at the beginning of the thirteenth century it was in a state of considerable decay. The reigning bishop, William of Seignelay, undertook the task of rebuilding it; he began the work in the year 1213, and died shortly afterwards. Succeeding prelates brought the cathedral to its present state; but even now it is unfinished, having remained in the same state since the middle of the sixteenth century, when France was so strongly convulsed with the wars of the League, and with religious troubles. The great portal is incomplete, and but one of the towers is finished; "its elegant appearance," say the French, justly "makes us the more regret the absence of its fellow, and the irregularity thereby produced."

An inspection of the engraving contained in the preceding page, will enable our readers to form a more accurate idea of the external appearance of this cathedral, than any detailed description could convey. The front there shown is the western or principal one; and the general arrangement of its parts is the same as in other cathedrals which we have already described. The interior is regular and pleasing; the nave, however, is somewhat narrow. The circumstance of the edifice being built on the side of a hill, occasions some irregularity in the level of its floor; a descent of six steps leads into the nave, and another of two leads from the nave into the choir. The rose-windows of this cathedral are the principal decoration of its interior; those of the transept are fine, though not in the best possible state of preservation.

The situation of Auxerre is extremely favourable for commerce; its position on the Yonne, which joins the Seine, enables it to enjoy all the advantages of an easy water-communication with Paris. Nevertheless, the inhabitants do not appear to have availed themselves of the facilities which are at their command; except in the article of wine there is little trade. "The wine-merchants," says Mr. J. M. Cobbett, "are of two sorts; the one buys the wine of the presser just as it is squeezed out of the grape, pays for it, and sends it to Paris; the other comes riding through the country amongst the owners of vineyards, getting them to send their wine to Paris, there to be sold for them on commission, and between the two sorts of merchants, the poor needy vine-grower doubtless suffers. I was greatly amused in hearing the conversations between the vine-growers and the merchants; the latter, a crafty set of men, taking advantage of every circumstance within their knowledge to persuade the poor grower out of his own, and the latter pleading excessive poverty, and ignorance greater probably than was his, to entice the notice of both sorts of merchants, and drive the best bargain he could between them.

"The wine of Auxerre is very famous; its general name is *petit vin d'Auxerre* (small wine of Auxerre); but there are two or three spots of the country near here, that are famous above the rest of the country for their produce. The white wine, called *Chablis*, is grown at a small village, (*Chablis*;) at about two leagues from Auxerre; and there are, close to the town the two Côtes, *la Chenette* and *la Migrène*, which are both of them famous for their red wine. I observed that all the vineyards between Fontainebleau and Paris were on the southern sides of hills; and here I find, that frequently spots of excellently well-adapted land for the plant, are not planted with vines, because they are not high enough. And whenever you hear of a good wine, it grows on a *côte*, or *side* of a hill. These *côtes* are particularly attended to, I see, by the wine-merchants, who go and place themselves on the spot, see the crop, see it gathered and put into the tubs by the road-side see it pressed, and then immediately send it off to Paris; and this, they say, is the only way to be sure of getting pure wine, because the moment it gets into the hands of the country wine-merchants they begin to mix it with their old stock, or with the strong wine of the south, in order to make *more Burgundy*." This explains how it is that wines, of very scanty growth in France, are rendered so very plentiful in the cellars of the innkeepers; the Côte de la Migrène yields scarcely more than 400 dozen bottles of its peculiar wine, and yet few inns in France would confess to being without a very good supply of it."

THAT knowledge is advanced by an intercourse of sentiments, and an exchange of observations, and that the bosom is disburdened, by a communication of its cares, is too well known for proof or illustration. In solitude, perplexity swells into distraction, and grief settles into melancholy; even the satisfactions and pleasures that may by chance be found, are imperfectly enjoyed, when they are enjoyed without participation.—DR. JOHNSON.

DISCRETION.—There are many more shining qualities in the mind of man, but there is none more useful than discretion; it is this, indeed, which gives a value to all the rest, which sets them at work in their proper times and places, and turns them to the advantage of the person who is possessed of them. Without it, learning is pedantry, and wit impertinence; virtue itself looks like weakness; the best parts only qualify a man to be more sprightly in his errors, and active to his own prejudice.—ADDISON.

## THE SEA.

On the surface of this globe, there is no where to be found so inhospitable a desert as the 'wide blue sea.' At any distance from land there is nothing in it for man to eat; nothing in it that he can drink. His tiny foot no sooner rests upon it, than he sinks into his grave; it grows neither flowers nor fruits; it offers monotony to the mind, restless motion to the body; and when, besides all this, one reflects that it is to the most fickle of the elements, the wind, that vessels of all sizes are to supplicate for assistance in sailing in every direction to their various destinations, it would almost seem that the ocean was divested of charms, and armed with storms, to prevent our being persuaded to enter its dominions.

But though the situation of a vessel in a heavy gale of wind appears indescribably terrific, yet, practically speaking, its security is so great, that it is truly said ships seldom or ever founder in deep water, except from accident or inattention. How ships manage to get across that still region, that ideal line, which separates the opposite trade-winds of each hemisphere; how a small box of men manage unlabelled to be buffeted for months up one side of a wave and down that of another; how they ever get out of the abysses into which they sink; and how, after such pitching and tossing, they reach in safety the very harbour in their native country from which they originally departed, can and ought only to be accounted for, by acknowledging how truly it has been written, "that the Spirit of God moves upon the face of the waters."

It is not, therefore, from the ocean itself that man has so much to fear; the earth and the water each afford to man a life of considerable security, yet there exists between these two elements an everlasting war, into which no passing vessel can enter with impunity; for of all the terrors of this world, there is surely no one greater than that of being on a lee-shore in a gale of wind, and in shallow water. On this account, it is natural enough that the fear of land is as strong in the sailor's heart as is his attachment to it; and when, homeward bound, he day after day approaches his own latitude, his love and his fear of his native shores increase as the distance between them diminishes. Two fates, the most opposite in their extremes, are shortly to await him. The sailor-boy fancifully pictures to himself that in a few short hours he will be once again nestling in his mother's arms. The able seaman better knows that it may be decreed for him, as it has been decreed for thousands, that in gaining his point he shall lose its object—that England, with all its virtue, may fade before his eyes, and,

While he sinks without an arm to save,  
His country blooms, a garden and a grave!

[QUARTERLY REVIEW.]

THE world has nothing solid, nothing durable; it is only a fashion, and a fashion which passeth away. The tenderest friendships end. Honours are specious titles, which time effaces. Pleasures are amusements, which leave only a lasting and painful repentance. Riches are torn from us by the violence of men, or escape us by their own instability. Grandeurs moulder away of themselves. Glory and reputation at length lose themselves in the abysses of an eternal oblivion. So rolls the torrent of this world, whatever pains are taken to stop it. Everything is carried away by a rapid train of passing moments; and by continual revolutions we arrive, frequently without thinking of it, at that fatal point, where time finishes, and eternity begins.

—ARCHBISHOP FLECHIER



## THE USEFUL ARTS.

## II.

## GATHERING AND PRESERVATION OF CROPS.—CAUSES OF FERTILITY IN THE EARTH.—VEGETABLE PHYSIOLOGY.

Grass, barley, oats, rye, peas, &c., are generally cut down by a *scythe*, the operation being termed *mowing*. This is regarded as the hardest of all agricultural labour; the weight of the scythe, acting on a long lever, the stooping position, and the motion backwards and forwards from right to left, calling nearly all the muscles of the body and limbs into strong action. This, too, has generally to be performed under a cloudless sky and in the hottest months of the year.



MOWING.

Wheat, beans, &c., are reaped by means of sickles, which are of two kinds; one has its edge cut into fine teeth like a saw, and is called the *sickle-hook*. In using this tool, the labourer takes a handful of the corn in his left hand, and cuts through the stalks or *straw* by a peculiar motion of the instrument in his right hand. The other kind of tool has a smooth edge like the scythe, and is called the *cutting-hook*. In some places another hook is used in the left hand, to collect the stalks together, ready to be cut with the sickle.



REAPING.

There are machines made for both reaping and mowing, but they are far from being generally employed. When the scythe is used to cut any kind of corn, a *cradle* of wicker work is often fixed at the end, which receives the plant as it falls, and prevents the grain from being scattered on the ground.

The crops are stored in various ways; hay and clover, after the plants are dried thoroughly by exposure on the earth to the sun, are made up into large *stacks*. It is the turning over of these grasses, so as to expose them as much as possible to the air, that constitutes *hay-making*. This operation is indispensable; for if the hay were put up while damp, or with too much sap in it, fermentation would ensue, by which so much heat is produced as to spoil the crop, and often set the stack on fire.

Corn is either stored in *barns* or *granaries*, or else made up into stacks, called *ricks*; but, in order to preserve these from the depredations of rats, mice, and other vermin, it is necessary that the ricks should be raised above the

ground, on a platform of beams, supported by stone posts, made with a cap at the top, projecting all round, to prevent the animals from climbing up them. Both hay and corn stacks are generally *thatched* to keep off the rain.

Potatoes are stored in pits dug in the ground, kept dry and cool by proper draining; but there is so much variety in the modes of storing crops which are to be speedily used, that it would be useless to go into the details of them.

The fertility of the earth is somewhat diminished by every crop that grows upon it. Formerly it was thought necessary to leave portions of the land, in succession, uncultivated for one year, to allow it to recruit its exhausted properties by a season of rest; this was called suffering it to lie *fallow*. Modern science has, however, shown that, besides the loss of produce occasioned by this practice, it is not only unnecessary, but often injurious; and that the object in view is better attained by judicious *MANURING*, and by that greatest of all improvements in agriculture, the proper succession, or *Rotation of Crops*.

Every genus of plants requires, for its perfect growth and fruitfulness, some particular chemical *principle* to be derived from the soil; hence, the land, when it has supplied to a crop raised upon it all that it possessed of that necessary principle, is no longer capable of nourishing the same plant, but, as far as regards that particular genus, becomes barren. With the aid of tillage, however, it is perfectly capable of nourishing some other kind of crop, which requires a different food from the soil.

The laws of vegetable physiology are, as yet, too little known to allow us to explain exactly, what the earth does towards nourishing vegetation, but the above *fact* being established by observation, experience alone could inform us what plants might succeed each other, and flourish on the same spot of ground. Of the various series thus found to answer, these are selected and employed which are also consistent with the more immediate objects of agriculture, and these series are again limited, by reference to the practical mode in which the farming-operations are to be carried on.

Although the earth, by a succession of crops, can be constantly active in their production, yet, as has been mentioned, it is necessary to restore to the soil, by the application of *manure*, certain principles which are required by all vegetation. One of the most essential components of manure is animal matter, and the cheapest and best form in which this can be applied is dung; to collect this in sufficient quantities, and in an easy mode, cattle must be fed in yards and stables, and to do this requires a store of *fodder*. Hence we see the necessity for raising extensive crops for the express purpose of feeding cattle, and these crops are so arranged as to constitute one of the series above alluded to.

Besides the turnip-crop already mentioned, as being devoted to this purpose *grasses*, *lucerne*, *clover*, *saintfoin*, *beans*, &c., are raised for cattle. This variety, with the addition of other crops required for the use of man, as well as for the food of animals, and for certain uses in the arts, admits of different rotations, adapted to every variety of soil, locality, climate, and to every other circumstance influencing the agriculture of a country.

When a crop is raised for its seed, the earth is far more exhausted than by one, the leaves or roots of which only are wanted, and which is, therefore, gathered before the fruit begins to ripen: hence all grain-crops, peas, beans, &c., &c., require a greater supply of manure to recruit the soil, than turnips, or the *artificial grasses*, as clover, lucerne, &c.

## PLANTS AND THEIR PRODUCTS CONSTITUTING A PRINCIPAL PORTION OF OUR FOOD.

## I. WHEAT.

MAN derives by far the greatest portion of his *vegetable food* from one *natural family*, or *order*, of plants; namely, the *GRASSES*,—an order equally well defined by its obvious as by its botanical characters. It is the *seed* only of the plant which is used, and of the different species cultivated for food, that called *WHEAT* is most generally diffused in all the northern temperate climates of the globe. The culture of these plants is so ancient, that its history constitutes a legend of the earliest mythology of the nation first civilized in Europe,—Greece: it may, indeed,

almost be regarded as the indication of advancing civilization, when a nation begins to raise wheat for food, and accordingly its culture spreads more and more in every part of the globe.

There are two varieties of wheat cultivated in Great Britain,—the *winter*, or *common*, and the *spring* wheat; but the first is the most general, and to that we shall confine our notice. The soils best adapted to the cultivation of this grain are loam and rich clay, but by the improved state of agriculture now attained in this country, wheat, by means of judicious rotations, may be, and is, raised on most soils. The seed is generally drill-sown in September or October, and the harvest is reaped in the following August. Under certain circumstances, however, the time of sowing varies from those months, to February, March, or even April.

In this country there is always a store of grain in hand, for present use, sufficient to obviate the necessity of having immediate recourse to the new harvest. Under proper management, wheat will keep for several years without losing its qualities, but it is better when consumed within a twelvemonth from the time of its being cut.

The *fruit* of the plant, properly speaking, is borne in a spike called an *ear*, thickly set, on the top of the stalk; and the *seed* constitutes the greater part of each separate fruit. The first operation to which the plant is subjected, is *THRASHING*, the object of which is to beat out the grain, or fruit, from the ear. Threshing is still performed by means of an instrument called a *flail*. This consists of a straight handle, about four or five feet long, to one end of which a short thick stick, of tough wood, is attached by leathern straps, forming a kind of hinge. In wielding the flail, the labourer, by a peculiar motion, causes the short stick to fall flat on the pile of grain which is spread out on the ground before him, and by repeated blows, he detaches the fruit from the withered flower, or *husk*, which remains adhering to the stem or straw. Threshing is also performed on most large and well-cultivated farms, by machines, of which there are several kinds. The employment of threshing-machines, as of machinery in general, saves labour, and time, and does the work more effectually, than it can be done by hand-labour. In time, they will, no doubt, supersede the flail, as certainly as the corn-mill has superseded the hand-mill for grinding flour\*.

The next process is *WINNOWER*, the object of which is to separate the fruit from the husk and chaff, which the threshing has mingled up with it. Formerly corn was winnowed by throwing up shovels-full against the wind, on a windy day; the heavier, solid, grain fell on the ground, while the lighter chaff was blown back, and separated from it. The object of the machines which have supplanted this rude and imperfect contrivance, is to effect the separation either by turning the corn quickly round in cylindrical sieves, which admit of the heavy ear, acted on by centrifugal force, escaping through the meshes while the light chaff is retained, or else to cause an artificial current of air, by means of *fans*, in an enclosed space, which prevents loss or waste.

When the *fruit*, or *grain* as it is called, is separated from the chaff, it is put in sacks to be sent to the mill, there to be *ground*. The exterior of a *WIND-MILL* is familiar to most persons, and water-mills are common on small rivers, and running streams. Whether the moving force be wind or water, it is employed for the purpose of turning round horizontally, by means of an upright axle, a thick, flat, circular stone, over another equal and similar stone, which is fixed beneath it. The surfaces of the two stones which are next each other, are cut into shallow furrows, in such directions, as may create by the moving round of the upper stone, over the fixed one below it, the greatest quantity of rubbing and grinding motion. The two surfaces do not touch each other, and the small distance which is left between the stones, is adjustable at pleasure, according to the nature of the grain: the nearer the stones work together, the finer will be the flour into which the grain is ground. The fans of the wind-mill, or the wheel of the water-mill, which cause the mill-stone to revolve, also by means of intermediate wheels, give motion to other parts of the machine intended to effect the several operations which the grain has to go through, to prepare it for grinding†.

\* See *Saturday Magazine*, Vol. I., p. 65.

† In the figure, the two sides and half the roof of an ordinary wind-mill are supposed to be removed, to allow of the interior being seen; every part is omitted but what is immediately necessary to the grinding:—A is a sort of tub, enclosing the mill-stones, by which case the flour is preserved from being wasted and scattered



INTERIOR OF A WINDMILL.

The object of the first of these operations, is to dry the corn so as to make it fit for grinding; this is performed in a kiln, the grain being laid on a tile floor, perforated with small holes, which allow the hot air from a fire beneath to penetrate through the layer of corn, and to dry it sufficiently. The tiles being very slow conductors of heat, the grain is not at all scorched in the process. When it has been sufficiently dried, the grain is removed to lofts to cool and mellow, which takes about five or six days.

The next process is cleaning the corn, or freeing it from all dirt, earth, &c., which may have become mixed with it. The machine to effect this is a cylinder, composed of iron-wire net, the meshes being wide enough to admit of the smallest grains, small gravel, and dust, falling through between them. This *separator*, as it is called, is commonly placed beneath the loft-floor on which the grain has cooled, so that this can be let down into the cylinder at once, through trap-doors. The cylinder is made to revolve rapidly, the motion sifting the corn, and freeing it from the smaller extraneous matters, while the larger are afterwards separated by hand.

From the separator, the grain is transferred to another double cylinder of iron-plate, punched full of small holes, so that the inner surfaces are rough, like a nutmeg-grater, the corn, by being turned round, and shaken between the two surfaces of the cylinders, is freed from the hairiness which remains at one end of each grain, consisting of the points of the floral envelopes of the fruit in a withered state. But the grain yet requires another sifting, before it is ready for grinding, and this is performed in a long square chest, the bottom of which is formed of wire-gauze. This sieve is made to move backwards and forwards, and to shake the grain well, while four broad, light fans, revolve

about; c is a funnel-pipe, through which the flour passes down into the bin d; n is the *hopper*, into which the corn is put, and whence it flows gradually between the stones through a hole at the top of A; to promote this passage of the grain, a jogging motion is given to the hopper by a simple contrivance; this causes the *clacking* of the mill, one of those sounds which has ever delighted the ears of lovers of nature and of poets; the large wheel y, on the axle of the fans, turns the *lantern-pinion* o on that of the stones, and gives the upper one its rotatory motion.

rapidly, and excite a current of air, strong enough to carry off the dust or bran rubbed off in the sieve. This operation is, in fact, a second winnowing. The corn, when thus completely cleaned by these three processes, is let into the hopper.

The meal, in the state in which it comes from the mill-stones, consists of the true flour, or *farina*, of the seed, mingled with the broken husk, or *bran*, which is the *fruit* of the wheat, a thin double skin closely adhering to the seed, and only separable from it by grinding. These skins are rough and harsh, and would impart a disagreeable flavour to bread.

The process of *boulting*, or of separating the bran from the flour, is performed by putting the meal into another kind of sieve, which is either a light wooden frame, over which canvass, or coarse muslin, is strained, and made to revolve rapidly, so as to sift the fine impalpable flour, and retain the *bran*, or, as is done in the more improved mills, a cylindrical hair-brush, like a bottle-brush, is made to revolve rapidly in a wire-gauze cylinder, the surface of which the wire just touches. The meal in the cylinder is driven out through the meshes, by the motion of the brush, and the bran, together with the coarsely-ground particles of flour, are retained. This coarse meal is re-ground, and again bouted, yielding a second quality of flour, and what remains after this second process is ground a third time, affording a third inferior kind of flour, in which there is much of the skin above mentioned. What remains in the bouting-cylinder after this third process is *BRAN*. This is used for various purposes, such as stuffing cushions, cleaning various kinds of metal articles, &c.

WHEN a distinguished English nobleman, who has lately succeeded to the title and large estates possessed by his father, was a boy, he generally spent the whole of the pocket-money allowed him as rapidly as most boys do. One day he asked a confidential servant of the family to lend him some money. The man, thinking it improper to advance the money without the knowledge of the earl, his father, evaded, by some excuse, immediate compliance with the youth's request, and acquainted his lordship with the circumstance. The earl questioned the servant respecting the manner in which his son spent the very liberal sum that was allowed him; and though he was not able to obtain satisfactory information on the subject, he authorized him to lend his son the money required, if he would tell him (the lender) what he wanted it for. When the young lord heard the terms on which the servant offered to lend him the money, he was very unwilling to agree to them; and no sooner was it in his possession than he hastened to a mercer's, and laid out the whole sum in blankets and flannels, which were distributed among a number of poor women, whom his lordship said he had observed scantily clothed abroad, and without covering at home, during the severest season of the year. It was then ascertained by the servant that this had been the way in which the benevolent youth had been in the habit of spending his allowance; but, when his father heard of it, his son's means of doing good to his fellow-creatures were no longer limited to the compass of a boy's pocket-money.

COWPER, the poet, in his memoirs of his early life, gives an affecting instance of the benefit frequently derived from the recollection of some consolatory text of Scripture. It occurred while he was at a public school. "My chief affliction," he says "consisted in my being singled out from all the other boys by a lad about fifteen years of age as a proper object upon whom he might let loose the cruelty of his temper. One day, as I was sitting alone upon a bench in the school, melancholy, and almost ready to weep at the recollection of what I had already suffered, and expecting at the same time my tormentor every moment, these words of the Psalmist came into my mind; "I will not be afraid of what man can do unto me." I applied this to my own case, with a degree of trust and confidence in God that would have been no disgrace to a much more experienced Christian. Instantly I perceived in myself a briskness of spirit and a cheerfulness, which I had never before experienced, and took several paces up and down the room with joyful alacrity—His gift in whom I trusted. Happy would it have been for me, if this early effort towards the blessed God had been frequently repeated by me!"

#### CONVERSION OF EDWIN, THE PAGAN KING OF NORTHUMBRIA, TO CHRISTIANITY.

EDWIN, having succeeded to the Northumbrian throne when hardly out of his cradle, was quickly set aside, and then stealthily conveyed away. Ethelfrid, who had usurped his crown, sent emissaries after him into every corner of the island where he took temporary shelter. At length he found protection at the court of Redwald, King of East Anglia. This prince, being assiduously plied by Ethelfrid with promises and menaces, began to waver. A friend of Edwin was informed of this, and advised instant flight. The royal youth had just retired to rest, but he hastily left his chamber, and withdrew beyond the dwelling, distracted by anxious apprehension. He had already wandered over most of England, in quest of safety, and he was now utterly at a loss to see any further hope. As night wore away, he probably sank into an agitated slumber. A majestic personage now roused attention, whose countenance and dress were wholly new. Edwin strained his eyes in agony. "Wherefore," said his unknown visitor, "sit you mourning here, while other mortals quietly repose?" He was answered, "It can be no concern of yours, whether I spend the night abroad, or on my couch." The figure said: "Do not think me unaware of your distress. I know it all. What will you give me, then, to set your heart at ease, and make Redwald spurn every overture of your enemy?" Edwin eagerly promised any thing that ever might be in his power. "Again, what would you give," the stranger added, "if I should enable you, not only to trample on your foes, but also to outstrip the power of every neighbouring king?" Edwin pledged himself, if possible, more largely than before. He was then asked: "Should he who cheers you thus with unexpected hopes, be found quite equal to crown them with success, would you take hereafter his advice, if he should recommend a course of life different from any followed in your family, yet far more excellent?" This, also, met with a hearty affirmative reply. "When this signal shall be repeated, *remember, then, your pledge.*" As these words were spoken, the figure pressed his right hand solemnly on Edwin's head, and immediately disappeared. After a short interval, the young Northumbrian saw that kind friend approach, whose warning had aroused him from his bed. Now he was, however, told that Redwald, influenced by the queen, had not only given up every thought of betraying him to Ethelfrid, but was even ready to furnish him with troops, for driving that usurper from his throne. He did aid him thus, and Edwin regained his patrimonial sovereignty.

After his triumphant return from taking vengeance upon Quichelm, king of the West Saxons, Paulinus\* desired an interview. In this, he slowly raised his right hand, and pressed it earnestly upon the royal head. Edwin started, and trembled violently. "You know this signal," the Italian said; "you know it to have been originally given by one whose words have most exactly been fulfilled. *Remember, then, your pledge.*" Edwin fell at the missionary's feet, and earnestly inquired his meaning. "By God's mercy," Paulinus added, "when even hope had fled, your life was saved. By the same mercy you have wonderfully prevailed over all your enemies, and regained your paternal throne. A third, and a greater instance of his mercy, yet awaits acceptance. *Redeem your pledge*, and the God, who has led you through so many dangers, to gain and to secure an earthly throne, will

\* An Italian, resident at the court of the queen, and who had come to England as a Christian missionary.



remain your friend until you reach the glories of his own eternal kingdom." Before such an appeal, Edwin was powerless. He professed himself anxious to redeem his pledge, as Paulinus claimed; and he desired only to delay baptism until he could receive it in company with his leading men.

There, duly met in a solemn assembly, and Paulinus having pleaded in favour of Christianity, Coifi, a Druidic pontiff apparently, thus addressed the royal president:—"It seems to me, O king, that our paternal gods are worthless, for no one has worshipped them more devoutly than myself; yet my lot has been far less prosperous than that of many others not half so pious." A chief then said,—"The life of man, O king, reminds me of a winter feast, around your blazing fire, while the storm howls, or the snow drives abroad. A distressed sparrow darts within the doorway: for a moment it enjoys the cheering warmth and shelter from the blast; then, shooting through the other entrance, it is lost again. Such is man: he comes we know not whence, hastily snatches a scanty share of worldly pleasure, and then goes we know not whither. If this new doctrine, therefore, will give us any clearer insight into things that so much concern us, my feeling is to follow it." Before such arguments, resembling so strikingly those of Indian warriors in America, Northumbrian paganism fell. Coifi was foremost in making war upon the superstition which had so severely baulked his worldly hopes. His priestly character obliged him to ride upon a mare, and forbade him to bear a weapon. The people, therefore, thought him mad when he appeared upon Edwin's charger, with lance in hand. He rode, however, to a famous temple, pierced the idol through, and ordered the building to be burnt. Soon afterwards, Paulinus kept a most impressive Easter, by holding a public baptism at York, in which Edwin, his principal men, and a great multitude of inferior people, were solemnly admitted into the Christian church.—SOAMES' *Anglo-Saxon Church*.

SOCIETY is making a rapid, and in many respects a gratifying advance in wealth, in civilization, in intellect: let us do our utmost, that the moral and religious virtues may follow in the train, encouraging the development of all that is really good, and counteracting what is evil. Let us leave the world wiser and better than we found it, and we shall leave it happier. It may be urged that our single exertions cannot do much to stem the vast tide of human passions and vices which the vortex of society sets in motion. I answer, that it is only by each individual doing his utmost in the line of his duty, without stopping to inquire to what degree others may be disposed to co-operate with him, that any extensive amelioration of public manners can take effect. Let us not forget, then, that a good example is the best of all possible instruction which we can convey to others. The life of a truly-good man, I mean, of course, of a sincere and humble-minded Christian, affords the most convincing of all public lessons. Many and many a Christian has existed, who, with no other object than that of standing one day before God with an unsullied conscience, has gone through his unobtrusive course, wholly unsuspecting of the benefits he was conferring, though meanwhile the silent operation of his example was quietly and imperceptibly moulding men's minds to a conformity of feeling, and rendering a good life more generally prevalent, by making it more familiar, and more amiable.—SHUTTLEWORTH.

REASON is always striving, always at a loss; and of necessity it must so come to pass, while it is exercised about that which is not its proper object. Let us be content at last to know God by his own methods, at least so much of him as he is pleased to reveal to us in the Sacred Scriptures. To apprehend them to be the word of God is all our reason has to do, for all beyond it is the work of faith, which is the seal of Heaven impressed upon our human understanding.—DRYDEN.

## THE MINES OF GREAT BRITAIN.

### VII. INCLINED PLANE AT WHEAL FRIENDSHIP COPPER-MINE.

AMONG those works of art which are most remarkable for their magnitude and boldness, there are probably few more interesting, than some which are occasionally executed in the deep and extensive mines of this and other countries. Works of this kind are, however, very little generally known; certainly much less so than they deserve to be, a circumstance occasioned partly by the local position of mines, which are usually situated in mountainous and barren districts, remote from towns, and partly by the peculiar nature of mining operations, which instead of rising above the surface of the earth in conspicuous masses, like the structures of the architect and engineer, consist of excavations buried deep below it, which, therefore, however great their magnitude may be, can never be viewed from any single point, or exhibit the unity and grandeur possessed by works of the former description.

The annexed sketch represents the mouth or entrance of an *inclined plane*, at an extensive copper-mine called Wheal Friendship, near Tavistock in Devonshire, a work of a very singular nature, there being scarcely any other examples of a similar kind.

To furnish a correct idea of the nature of this inclined plane, it will be necessary shortly to remind the reader of the various modes by which access is obtained to the underground workings of mines, for the purpose of raising the ores and other substances, which are required to be brought to the surface. They are chiefly of three kinds:—Perpendicular shafts or pits,—Day-levels or adits,—and lastly (although but rarely), Inclined planes, as in the case before us.

The pits or shafts used in mines, are by far the most usual and important means of access, always penetrating to the deepest excavations. They are very similar to common wells, but of larger dimensions, most generally of a rectangular form, and supported, when necessary, by a timber framework, as noticed in a former article, instead of by brickwork. Shafts have been carried in this country to the depth of nearly 1600 feet, and in others to between two and three thousand.

Day-levels or adits are simply tunnels or horizontal passages, which are excavated from the lowest convenient point in some neighbouring valley, into the side of the hill or mountain, in which the mine is situated. They are similar to the tunnels occasionally excavated for canals and railways. Where support is required, it is generally afforded by timbering, but sometimes also by walling. They differ, however, from ordinary tunnels, in having but one outlet at the surface, instead of two, the other extremity terminating in the mine, and usually at a great depth from the surface. Excavations of this kind are sometimes carried for several miles, although not commonly in a direct line.

Inclined planes partake both of the nature of shafts, and levels; like the former, they penetrate to the deepest excavations of the mine, and like the latter, serve as roads for the carriage of ores, and other substances. They may, in fact, be considered as *inclined tunnels*, having but one communication with the surface.

At the mine called Wheal Friendship, there are two inclined planes, distinguished as "*the old*" and "*the new*," both beginning near the same point on the surface. The old inclined plane was about 500 yards in length, and the depth at the end, perpendicular from the surface, was 600 feet, the angle it formed with the horizon, being about 20 degrees.

This plane was in use for a considerable time, but circumstances rendered it desirable to form another of much greater depth, which was begun about seven or eight years since, and is now in use.

This inclined plane is 650 yards in length, and attains to a depth of about 1025 feet perpendicular below its mouth, or 1100 feet below the surface, which is elevated nearly 100 feet higher above the end of the plane, than it is near its mouth. The inclination which it forms with the horizon, varies from thirty to forty-five degrees, an angle which far exceeds that of the inclination of the highest and most abrupt mountains, in this, and probably any other country, and consequently, up so steep an ascent, no carriage could be propelled, excepting by the power of machinery.

This remarkable tunnel is about seven feet high, and five feet wide, and is supported, where necessary, by timbering, except for a short distance near the surface, where masonry is used. A railway, consisting of a single track of edge-rails, is carried along the plane, from the top to the bottom, and is extended for a short distance also upon the surface. The wagon used is made of wrought-iron.

The power used for drawing up the wagon and its load, which consists of the ores, and sometimes the rock from the bottom of the mine, is that of a large overshot water-wheel, forty feet in diameter, and five and a-half feet in breast, which is turned by a considerable stream of water, which, with another of equal size, is conducted several miles through a *leat*, or artificial channel, in order to work this, and the other machinery belonging to the mines. These two streams furnish a constant supply of more than 5000 gallons per minute. The water-wheel is erected at the surface, within a short distance of the mouth of the inclined plane, and is connected with the wagon which it draws up, by a strong chain passing over rollers, at intervals of a few feet.

Although the length and inclination of the plane have been given in a manner sufficiently intelligible to those conversant with subjects of the kind, there are probably many persons who will be unable to form an adequate idea of these particulars, unless placed before them in the more obvious and familiar light of an elevation *above*, instead of an excavation *below*, the surface of the earth. This may, perhaps, be done in the following manner. The height of St.

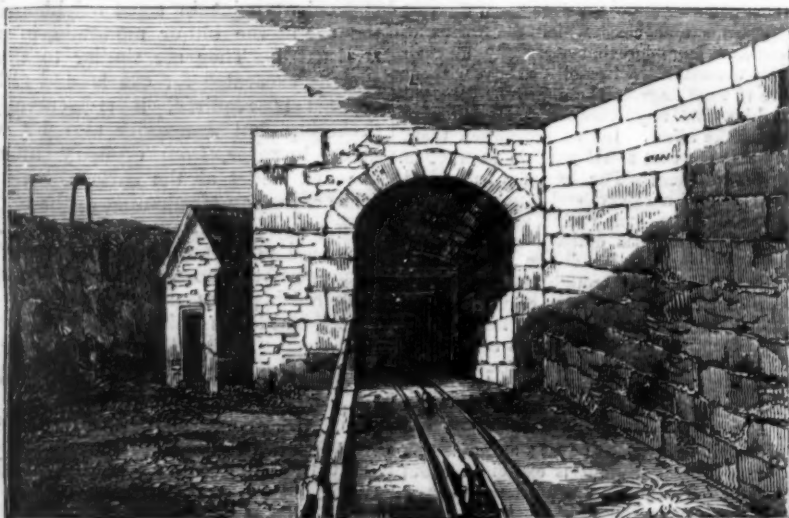
Paul's Cathedral, to the top of the ball and cross, is 360 feet; supposing, therefore, that two buildings of equal altitude were placed upon it, we should have an elevation of 1080 feet, answering nearly to the perpendicular *depth* of the end of the inclined plane below its mouth, which was before stated at 1025 feet. If from this immense elevation, we conceive two ropes or imaginary lines, about four feet apart, to be extended through the air, following the line of Ludgate Hill, and reaching the ground at the eastern end of Fleet Street, (a distance of above 500 yards,) the *length* and *slope* of the inclined plane, will be pretty correctly figured to the imagination.

Any description of the mine itself, would far exceed the limits of this article; it may be added, however, that besides the work we have been considering, there are at Wheal Friendship, five or six pits or shafts, some going nearly to, and others exceeding, the depth of 1000 feet, and levels (or horizontal subterranean passages) to the aggregate extent of several miles, the latter being placed one below the other, at fifty or sixty feet apart, and communicating with the shafts.

Upon the surface, besides the water-wheel employed at the inclined plane, there are four others of larger size (one being fifty feet in diameter), and three smaller ones, all being turned by the powerful streams of water before noticed as being conducted to the mine for this purpose, by artificial channels. Four of these large wheels are employed in pumping out the water, which accumulates in such a quantity in the subterranean workings, that it is necessary to raise a stream of 700 or 800 gallons per minute, to prevent the mine from being inundated.

This slight description may, perhaps, serve to afford the reader some idea of the magnitude and extent of those operations, which it is necessary to carry on in the bowels of the earth, in order to procure those metallic substances, with the use and properties of which, every person must be familiar, although comparatively few are acquainted with their history, and the processes by which they are obtained. It is needless to remind the reader, how essential an abundant supply of the metals is, to a civilized state of society, or to point out their varied and infinite utility, in all the arts and sciences which promote the welfare and happiness of mankind\*. F. B.

\* See *Saturday Magazine*, Vol. IV, p. 43; Vol. V., pp. 76, 180, and 223; and Vol. VI., p. 118.



INCLINED PLANE AT WHEAL FRIENDSHIP COPPER-MINE.